1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

411 226 237 is inserted into the reed shaft (fig. 19, *a*, *f*). The barb on the iron point is obviously more effective than on the bone point.

225 For crocodiles the arrow point is always of iron, barbed and detachable. Its length is considerably less than the other, measuring about 4 feet or less. A string about 30 feet long is attached to the point and wrapped tightly around the shaft. When the point strikes the animal the string becomes unwound and if the animal dives into the water the hunter can trace it by the shaft floating on the surface. He then proceeds to pull up the animal.

411 224 For deer and chiguire, land animals, a broad iron blade is used for the point, so heavy that one would suppose it would be a lance head. This is inserted into the shaft and at the point of insertion a crosspiece is fashioned to the shaft so that the point cannot penetrate more than 4 or 5 inches. The reason for this is that the Yaruro is afraid to lose his arrow should he fail to kill the animal and it were to run away. A barbless arrow will tend to fall out of the wound if the animal races away and then the hunter can recover it.

411 223 For birds, the bone-pointed arrows are used and sometimes a special arrow consisting of a shaft with a wooden knob. However, since birds are hunted so seldom there is very little use for special arrows.

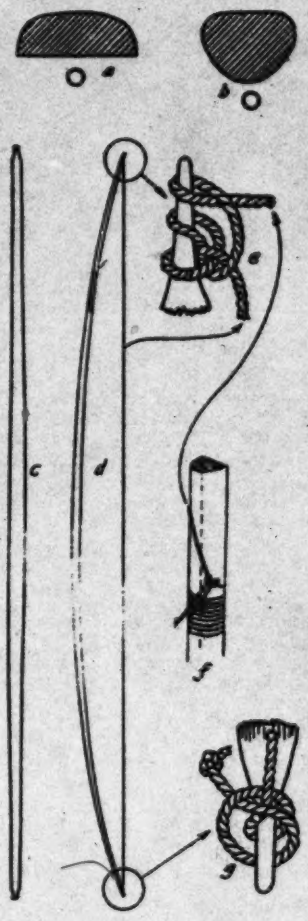


FIGURE 17. — Yaruro bows. *a*, *b*, Cross sections of bows. Circles represent original shape of wood, measuring about 7 cm before it is cut down to shape "*a*" and "*b*." *c*, *d*, Yaruro bow. One specimen measured 195 cm in length, 3.2 cm wide in cross section, 2 cm in thickness. *e*, *f*, *g*, Detail of knots on bow string.

411 326 412 The iron points are well made. Each man tries to possess himself of a stone and an iron hammer, but actually in the entire group that I saw, there were only two stones and one hammer. Iron is hard to obtain, and any scrap which comes into their possession is employed either as a knife or an arrow point. The iron is shaped both by hammering and by filing. I saw only one file in the group. At best, it must cause them a great deal of labor to fashion any of these points.

2 [see category 116, 207 --- Analyst]

1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

Perhaps that is one reason why no man had in his possession more than three or four arrows—for the most part he had only one of the iron tip kind.

FISHHOOKS.—Most of the fishing is done with bow and arrow, but hooks are known to the Yaruros, and when they are able to obtain strong fine string they employ these hooks. Hooks are not only em-

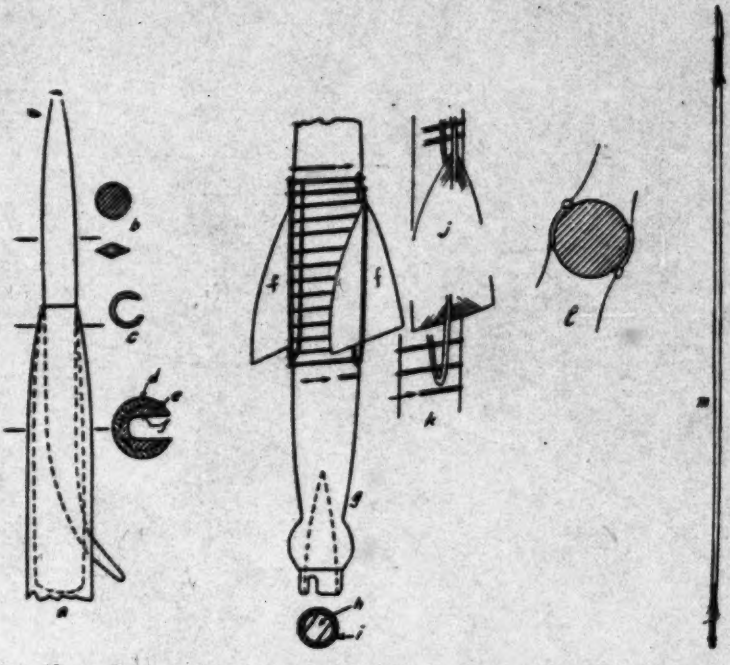


FIGURE 18.—*a*, Bone or iron point attached to shaft. *b*, Cross sections of points; round cross section is of the bone point; diamond-shaped cross section is of the iron point. *c*, Cross section of wax and twine binding. *d*, Cross section of reed shaft. *e*, Cross section of brazil wood to which point is actually fastened. *f*, Feathers. *g*, Butt end of arrow. *h*, Wooden plug nock. *i*, Reed shaft. *j*, *k*, *l*, Method of fastening feather to the arrow. *m*, Fish arrow.

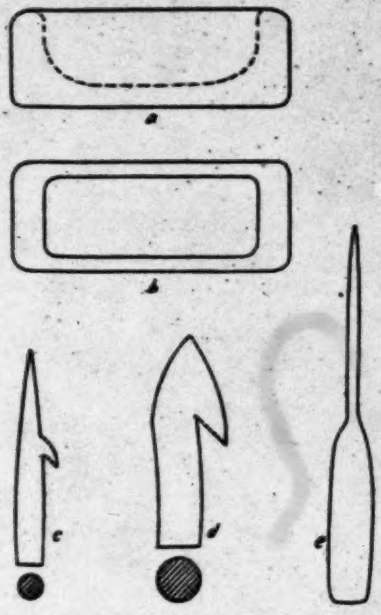
ployed for fish, but even for the chiguire, and sometimes for the crocodiles. The simplest kind is that shown in figure 20, *c*, which may consist of bone or wood. It measures about 6 inches in length. A stronger point of iron or hard wood is used for the manatee. This type is shown in figure 20, *d*. For crocodiles, generally a hard stick sharpened at both ends and baited with a large piece of meat is used. The crocodiles will swallow the stick and, if it is attached to a thick wire, it makes an excellent means of capturing these beasts.

DIGGING STICKS.—Next to the bows and arrows, the most important implement of the Yaruro is the digging stick, which will consist of a wooden handle from 3 to 4 feet long slipped into the handle of an

1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

412 322 [437] iron hoe, which is also made by the Yaruro out of any heavy scrap of iron that they may gather. Sometimes they will work for the ranchers and with their earnings purchase this type of hoe from a trader. However, such a digging tool is quite a luxury and sharpened sticks are more common.

[252] [222] 415 322 MORTARS AND PESTLES.—During the rainy season, the Yaruros gather chigua, a seed, which they dry and pound into flour. Mortars of wood shaped as shown in figure 20, *a*, *b*, are used and the pestle is any ordinary hard stick.



513 854 COOKING LADLES.—These are small wooden paddles used in cooking, especially when meat is boiling in a pot (fig. 20, *e*).

HAMMOCKS.—The Yaruros prefer to sleep on the sands, especially during the dry season. The men make hammocks, however, small ones generally used by children as cradles, and by the women shamans when they sing, during the day. During the rainy season they may employ them for sleeping.

[137] 286 462 FIGURE 20.—*a*, *b*, Wooden mortar. *c*, Bone or iron point used for hunting chiguire. *d*, Hook used for manatee. *e*, Cooking paddle.

The fiber employed to make the hammock string comes from the moriche leaf. The string may be very fine, of course, depending on the interest of the maker. It is made by the men. To weave the hammock a loom is made of two poles thrust into the sand to which are fastened two crosspieces at both the top and bottom. The string is then wound around these crosspieces. The weaver employs a knotter's netting technique. When the entire hammock has been woven the weaving is held in place by another string thrust through one of the woven rows.

[137] 283 ROPE.—The fiber mostly employed by the Yaruros is taken from the leaf of the moriche and the macanilla. The inner cortex of the leaf is stripped off and dried and then is taken apart strand by strand. These long fibers are then moistened and twisted together in two's and three's into a string by rolling them on the thigh with the palm of the hand. A stronger string is made in the same way and used for making hammocks. The bow strings are made from the fiber of the macanilla.

1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

291 177 after I had been among the Yaruros for a time the women often discarded their camisoles, even though I were present.

291 286 462 The men would normally wear a breechclout which originally was woven by the women from the fibers of the moriche palm leaf, but now it consists of a piece of cloth. Formerly the women wove wide belts of the same fiber for the men, but this is no longer done. The breechclout is held in place by a string tied around the waist.

291 287 The women, underneath their camisoles, still wear the old-fashioned Yaruro girdle, which is made from the fibers of the moriche palm. The fibers, which are about 2 feet long, are fastened together at one end. This end is slipped through a hair rope tied around the waist, and the whole mass of fibers passes between their legs and under the waist string. Plate 25, 4, shows a Yaruro woman wearing one of these girdles. It is fastened in such a way that an enormous knot is formed in the rear, and when wearing their camisole the women have the appearance of sporting large tails.

562 291 301 The women on the whole seem to be more conservative than the men in their clothing and body decorations. Below the knees and around the ankles they wear a thin string, and often they have necklaces of carved asabache figures, which are shown in plate 21.

DELOUSING TOOL

412 515 462 302 An implement that is in great vogue is the delousing tool shown in plate 20, 2. The serrated end is used as a comb to expose the lice, which are seized between the fingers and crushed between the teeth. The pointed end is employed to crush blisters raised on the body by mosquito bites. These tools, also fashioned by the men, are used exclusively by the women to groom their menfolk and each other.

CARRYING NETS

482 286 854 Carrying nets, of the knotless variety, are woven and used to carry children and food. When carrying children the net is slung across the chest from one shoulder; when carrying food it is supported by the head.

COOKING

252 462 The culinary art among the Yaruro is poorly developed. Much of the fruit and the eggs are eaten raw. Fish is eaten half raw and the meat of the crocodiles and turtles is merely warmed over the fire. Sometimes the meat is boiled. In the afternoon the women who have gathered firewood are to be found in camp waiting patiently for the men. On the hot coals they will have eggs and changuango. If the hunt is successful, and no hunt is considered

1 [see category 116, and plate 15, - - - Analyst]

1: Petrullo E-3 (1933-34) 1939 SS19 Yaruro SS19

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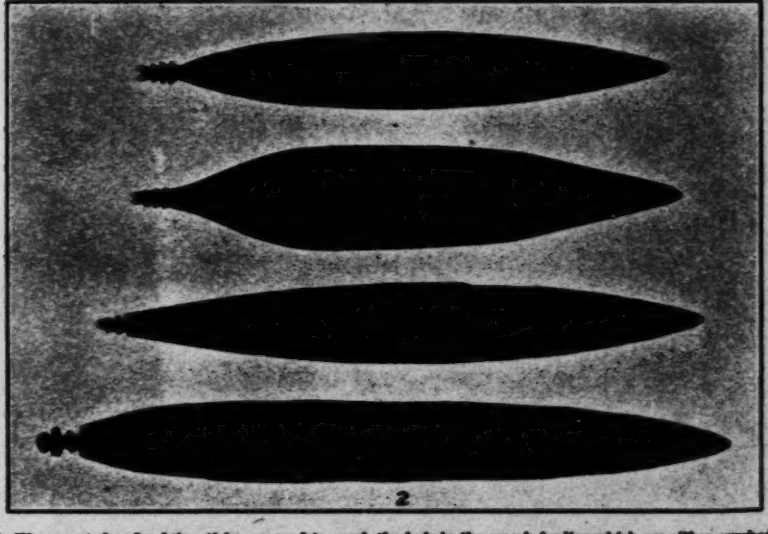
287
291

1. a. Fire sticks. Fire is produced by drilling one piece of laurel wood into a second. b, Fire fan. c, Horizontal piece is a hair rope worn around the waist by the women and the hairlike vertical piece is made from the moriche palm leaf and dyed red. The two pieces form the women's girdle.

515
412



2

2. The serrated ends of the sticks are used to comb the hair in the search for lice which are either crushed between the fingers or between the teeth. The pointed ends are used to crush the blisters raised by various insects.

[End Plate 10]

represent his people to the outside world without consultation and to make arbitrary decisions for them inside the community — mainly in his own interest — was, with the consent of the community, assassinated by one of the members, now in excellent standing in that community as a respected shaman. The chief in question had stepped beyond the bounds designated for his status. In sum, the position of chief, even though formally recognized by Yaruro society and reinforced by formal recognition and appointment by Venezuelan authorities, is feeble as an institution and as a status.[6] It is our hypothesis that ecological conditions of Yaruro life determine the form of the chieftainship in such a way that its stronger institutionalization would be impossible, and we turn to this question now.

III

Yaruro subsistence activities[7] comprise swiddening, gathering, pig herding, hunting and fishing, mentioned in the order of their importance as contributors to the total food supply as measured in calories.[8] Horticulture probably provides 60—70% of the total annual food supply. The horticulture practiced is characteristic of tropical forest slash-and-burn gardens, with a slow rotation of plots in order to permit soil renewal and weed control. Trees are cut, at present with steel axes and formerly, apparently, with axes of bone or shell, and then burnt. Occasional fences are roughly made of the logs to keep out pigs. Bitter manioc (*Manihot utilissima*),[9] in several varieties, is the main crop, though sweet manioc (*Manihot aipi*), also in several varieties, is planted too, as are corn, bananas, sugar cane — each in several varieties — and a number of lesser crops such as melons, squashes, pumpkins, pineapples, sweet potatoes, and yautia or ocumo (*Xanthosoma sagittifolium*). Crops are planted with a digging stick which may also be used in harvesting. Gardens are weeded, once only, early in the growth of the crops. Other than clearing, the only soil preparation is the construction of hills for planting bananas. This is done by burning hills made by a certain species of ants (*huachaquero*). The hills, which are quite wide and low, are filled with organic matter enriching the soil.[10] Harvesting is aided with baskets for carrying the crops. Baskets contain about half a bushel or less. No fertilization, no terracing, no drainage, no irrigation, no extensive turning of the soil is done.

The gathered resources include a number of roots, particularly changuango, changuanito, and guapo (*Marante arundinacea*);[11] varied fruits, especially that of

[6] Professor Benjamin N. Nelson informs me that in medieval Spain, village communities had an official, also called *capitan*, whose function was to treat with state functionaries representing the world beyond the village community's frontier. It is possible that the Yaruro capitan, and many others in Venezuela, are an acculturative transfer of this office to tribal groups. In the case of the Yaruro, this would have happened some 250—300 years ago.

[7] The use, here, of the terms 'activity', 'tasks', 'techniques', 'tools', 'resources', and 'habitat' corresponds to the definitions given in Leeds, 1960 b.

[8] Cf. Leeds, 1961, which gives this data in detail and describes the habitat and horticulture *in extenso*.

[9] Native terms for these crops are given *ibid.*

[10] *Ibid.*, note 9, contains data on soil values.

[11] Identifications are from Pittier, 1926.

the moriche palm (*Mauritia flexuosa*); several seeds, notably chiga (= chigo?; — *Campsiandra comosa*); calabashes (*Crescentia Cujete*), and bees' wax and honey. Non of the items gathered are large in size or difficult of access except the bees' wax, one or two of the fruits, and calabashes which grow on higher trees, or may be very far. Gathered foods may be picked up by hand or with the aid of a digging stick or machete, and may be brought back in the harvesting baskets. Other items which may be gathered include the raw materials for baskets and mat-making or for food-processing tools such as the tipití, pots, or mortars and pestels. These items include the fronds of the moriche palm, used for making cord, baskets, tipitís, mats, and sacks; in some villages, clay for pots; reeds for arrows, wood for house beams, mortars and pestles, bows, and for cooking utensils. Wood, palm fronds, and many other items are gathered with the help of the all-purpose machete.

Pig herding is unsystematically done. The pigs, a recent acquisition, spend most of their time at will in the foraging grounds. The significant herding activity occurs only at times when one or another of the groups of pigs breaks into the gardens, an almost daily occurrence. They are then driven to the foraging grounds again, or if late in the day, into a close till morning when they are either driven forth again or allowed to scavenge in the village. There are several herds of pigs of sizes varying from perhaps a maximum of 20 including piglets to the more usual six or eight animals. The only tools used in pig care include a slaughtering stick with which the pig is clubbed to death and knives to cut up the meat. The close is built of logs cut with a machete and carried in by one or two men. Pig meat, though eaten with regularity, is definitely a secondary element of diet.

Hunting is done almost exclusively with the bow and arrow. There are several types of arrows. One for fish has a metal point approximately 4 inches long with a side hook about five inches from the tip, where the tip is set into the shaft. This may also be used for smaller animals. One for birds has a blunt wooden head, and does not appear to be used very often. A third type is used for larger animals such as deer and capybara. It has a blade about 6 inches long shaped like a laurel leaf and, at present, made of steel. At the base of the blade, a small cross-piece is affixed in order to prevent the precious blade from piercing so deeply into the animal that, if it escapes, it would carry the arrow away with it. The fourth type of arrow is used for turtles, tortoises, and alligators or other animals which submerge. The head is short and strong with a sharp recurved hook. The entire metal head is attached to a cord, and this in turn is attached to the arrow shaft, from which the head is detachable. On detaching, the shaft floats and the game can be followed in its underwater course. The bow is generally about 6 feet long or a little more. It is made rather crudely of the wood of the macanilla palm (*Bactris Gaspiaes*). Some animals, especially land tortoises and armadillos, may be caught by hand. Alligators may also be hunted with exceedingly heavy steel hooks and a strong line. In hunting, no traps, nets, surrounds, or drives are used.

Fishing is done chiefly with bows and arrows, though an arrow may sometimes be used as a spear, repeatedly jabbed into grassy waters near the river banks. Fishing may also be done with hooks and lines of different sizes. Bait is also used. A man may fish from a platform built by lashing logs horizontally to two trees

and then shooting into the still side pools of a stream into which he has driven a post with bait attached. He may also stand in a canoe to shoot. It is reported, though I have not myself seen it, that barbasco (*Jacquinia revoluta* or *mucronulata*) poison is used by some Yaruro.[12] No nets, weirs, traps, sweeps, or artificial fish pools are used.

Given the techniques and tools of the Yaruro, all the subsistence activities described can conveniently be done by one person. Some *must* be done by one person only, since the tools and techniques themselves do not permit two or more persons to operate jointly. As it were, the logic of the tools and techniques concerned demands utilization by single persons.[13] Some of the tools and techniques might conveniently involve two or more persons, e. g. lashing tree trunks together to make a fence or cornering a capybara, but do not definitively *require* more than one person. Activities of all sorts may be done by aggregates of persons, each utilizing his own tools and techniques individually but neither the activity, the tools nor the techniques entail the aggregation of individuals. Thus, from the point of view of human organization, the technology, by itself, entails no managerial functions, no coordination of tasks which must be overseen by someone occupying an appropriately defined status.[14] That is, there are no technologically determined positions of leadership in Yaruro society. Further, the technology as such entails no significant cooperation in work organization, even when this is convenient, and correspondingly, no standard work groups or management functions, as represented in some defined status, for facilitating cooperation are to be expected or to be found. In fact, Yaruro technology and resource distribution are such as to elicit considerable dispersion of activities and actors at any given time of work, and to inhibit the development of rank and the personal acquisition of superordinating prestige.

IV

We may now examine the habitat aspect of the ecological relationship. A clearly marked annual cycle occurs in the Yaruro habitat.[15] However, despite a sharp seasonal change from heavy rains up to 60 inches in one half of the year to almost

[12] Personal communication from Mr. Thomas Rootes who has studied Yaruro linguistics for a number of months, having visited several groups.

[13] Different kinds of tools require different kinds of organization. A simple hand saw can be used by only one person at a time. A logging saw, though it can awkwardly be used by one person, is surely best used by two persons. Certain other saws, e. g. jig saws, make up one of a series of machine processes on a single part of a product, the entire series being the unit of operation which requires a still more complex level of organization. Cf. Leeds, 1960 b.

[14] For the structure of argument which is involved here, see Leeds, 1960 b.

[15] 'Habitat' here refers to all physical objects and conditions of the environment which are relevant to the existence or production of resources as defined by the culture. For the most part, then, 'habitat' refers to those environmental conditions such as humidity, temperature, insolation, rainfall, etc., which affect the food supply, as well as the food and water available for animals and plants and other culturally relevant physical objects. By extension, it refers to daily, seasonal, annual, and long-term variations and cycles in the various relevant factors of the environment, whether climatic, geologic, or biotic, which affect any of these supplies.

4: Leeds E-5 (1958) 1960 SS19 Yaruro SS19

along the west-to-east flowing rivers in ribbons some kilometers wide. Most significant fauna and flora of economic use occur in these ribbons. This ecological distribution of resources governs subsistence activities whether they be mainly hunting, fishing, collecting, or horticulture.

Yaruro subsistence comprises all these activities. (2). Horticulture in the rainy season appears considerably to outweigh all other sources of food together, but in the dry season, hunting, fishing, and collecting perhaps equal or outstrip horticulture. In any case, slash and burn gardening of manioc, corn, plantains, and a number of lesser crops is by far the single most important economic activity. The technology is exceedingly simple in all aspects of production, the main tools being the machete and digging stick. The most elaborate technology occurs in the conversion of food into edibles and in the manufacture of hammocks, pottery, objects of wood such as canoes, and woven containers of all types.

The economic organization displays a sharp division of labor between men's and women's work. Men do all hunting and fishing, make all objects of wood, haul lumber and householding materials, make hammocks, and carry out the heavy labor of gardening. Women do most of the collecting of roots, seeds, and fruits. Since collecting contributes a substantial portion of the food supply in summer, woman's contribution, here, is of considerable communal importance. Women's work, a continuous activity from dawn to dusk, is, first, the conversion of raw foodstuffs into edibles. Second, women make all pottery, mats and baskets, the manioc squeezers, and much of the cord used to make hammocks. Another important contribution of women is their help in harvesting in the gardens. Men sometimes help the women with the cookery.

Men may work alone, in groups of 2 or 3, or in larger groups on rare occasions. No occasion exists for all men to work at a single task since there is no technological need for it. Women's work groups for collecting or householding are of similar size. Work group alignments are often based on choice or accident but in other instances coresidence and kinship are determinants. The household, however, constitutes the only really necessary cooperative group for production. The man is a funnel for produce which the woman converts to

(2) The present description applies to the Cinaruco River Yaruro where the major part of the writer's field work, supported by a grant from the Social Science Research Council, was done. The Capanaparo River Yaruro were reported by Petrullo (1939) and Le Besnerais (1948) as being hunters and gatherers, although Le Besnerais observed small horticultural patches which he claimed were diffusions from Venezuelan farmers which had occurred recently. Le Besnerais in 1954 states directly that they were horticulturalists, omitting any mention of possible diffusions from Venezuelans. The passing mention of horticulture by Pinason (1947) confirms the present writer in his opinion that, although horticulture may be more restricted on the Capanaparo than on the Cinaruco and Cunaviche-Arauca (where the writer also spent several weeks) which are not discussed at all by Petrullo or Le Besnerais, nevertheless, the absence of horticulture is probably not aboriginal with the Yaruro as has been suggested by Kirchhoff (1948, p. 456). Rather the restricted gardening is a result of ecological conditions on the Capanaparo which are less favorable to horticulture than on the neighboring rivers, combined with extremely violent acculturation, including large-scale massacres of natives. The only other possibility, in my opinion, is that horticulture was introduced by the missionaries in the early part of the Eighteenth Century, which is certainly the period when the Yaruro first became acquainted with iron tools (cf Lodares, 1922).